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(54) **GRANULES D'ADDITIF POUR DES ARTICLES MOULES  
AYANT UNE ACTION DETERGENTE ET NETTOYANTE**

(54) **ADDITIVE GRANULES FOR MOULDED BODIES HAVING A  
DETERGENT AND CLEANING ACTION**

(57) Additive granules for detergent shaped bodies, characterized by a content of a) 10 to 95% by weight of cellulose having particle sizes below 100 µm and b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers

## Additive Granules for Moulded Bodies Having a Detergent and Cleaning Action

This invention relates generally to disintegration aids for compact shaped bodies having deterative properties. More particularly, the invention relates to so-called disintegrator granules for use in detergent shaped bodies such as, for example, detergent tablets, dishwasher tablets, stain  
5 remover tablets or water softening tablets for use in the home, more particularly for use in machines.

Detergent shaped bodies are widely described in the prior-art literature and are enjoying increasing popularity among consumers because they are easy to dose. Tabletted detergents have a number of  
10 advantages over powder-form detergents: they are easier to dose and handle and, by virtue of their compact structure, have advantages in regard to storage and transportation. As a result, detergent shaped bodies are also comprehensively described in the patent literature. One problem which repeatedly arises in the use of detergent shaped bodies is the  
15 inadequate disintegrating and dissolving rate of the shaped bodies under in-use conditions. Since sufficiently stable, i.e. dimensionally stable and fracture-resistant, shaped bodies can only be produced by applying relatively high pressures, the ingredients of the shaped body are heavily compacted so that disintegration of the shaped body in the wash liquor is  
20 delayed which results in excessively slow release of the active substances in the washing process.

The problem of the overly long disintegration times of highly compacted shaped bodies is known in particular from the pharmaceutical industry where certain disintegration aids, so-called tablet disintegrators,  
25 have been used for some time in order to shorten the disintegration times. According to Römpp (9th Edition, Vol. 6, page 4440) and Voigt "*Lehrbuch der pharmazeutischen Technologie*" (6th Edition, 1987, pages 182-184),

tablet disintegrators or disintegration accelerators are auxiliaries which provide for the rapid disintegration of tablets in water or gastric juices and for the release of the pharmaceutical principles in an absorbable form.

"Hagers Handbuch der pharmazeutischen Praxis" (5th Edition, 5 1991, page 942) classifies the disintegration accelerators or disintegrators according to their action mechanism, the most important action mechanisms being the swelling mechanism, the deformation mechanism, the wicking mechanism, the repulsion mechanism and the evolution of gas bubbles on contact with water (effervescent tablets). In the case of the 10 swelling mechanism, the particles swell on contact with water and undergo an increase in volume. This produces local stresses which spread throughout the tablet and thus lead to disintegration of the compacted structure. The deformation mechanism differs from the swelling mechanism in the fact that the swelling particles were previously 15 compressed during the tableting process and now return to their original size on contact with water. In the case of the wicking mechanism, water is drawn into the interior of the shaped body by the disintegration accelerator and loosens the binding forces between the particles which also results in disintegration of the shaped body. The repulsion mechanism differs 20 additionally in the fact that the particles released by the water drawn into the pores repel one another under the effect of the electrical forces generated. A totally different mechanism forms the basis of "effervescent tablets" which contain active substances or active-substance systems which, on contact with water, release gases that cause the shaped body to 25 burst. In addition, it is known to use hydrophilicizing agents which provide for better wetting of the compressed particles in water and hence for faster disintegration.

Whereas substances which act by the last two of the above-mentioned mechanisms can easily be distinguished from other 30 disintegration mechanisms, the effects on which the swelling and

deformation mechanisms and the wicking and repulsion mechanisms are based cannot always be clearly distinguished from one another, so that classification into hydrophilicizing agents, gas-releasing systems and swelling disintegrators is more appropriate for practical reasons.

5       The first group includes, for example, polyethylene glycol sorbitan fatty acid esters while the second group includes systems of weak acids and carbonate-containing disintegrators, more particularly citric acid and/or tartaric acid in combination with hydrogen carbonate or carbonate. However, magnesium peroxide which releases oxygen with water is also  
10       used as a disintegrator.

By far the largest group of disintegrators acts by swelling and/or wicking. These disintegrators include, in particular, starches, celluloses and cellulose derivatives, alginates, dextrans, crosslinked polyvinyl pyrrolidones, gelatine, formaldehyde casein and also typically inorganic  
15       substances, such as the various clay minerals (for example bentonite) and Aerosil® (silica) and certain ion exchanger resins (Amberlit®).

According to the teaching of European patent EP-B 0 523 099, disintegrators known from the production of pharmaceuticals may also be used in detergents or cleaning products. The disintegrators mentioned  
20       include swellable layer silicates, such as bentonites, natural materials and derivatives thereof based on starch and cellulose, alginates and the like, potato starch, methyl cellulose and/or hydroxypropyl cellulose. These disintegrators may be mixed with, or even incorporated in, the granules to be compressed.

25       According to International patent application WO-A-96/06156 also, it can be of advantage to incorporate disintegrators in detergent or dishwasher tablets. Once again, microcrystalline cellulose, sugars, such as sorbitol, and also layered silicates, more particularly fine-particle swellable layered silicates of the bentonite and smectite type, are mentioned as  
30       typical disintegrators. Substances which contribute towards gas formation,

such as citric acid, bisulfate, bicarbonate, carbonate and percarbonate, are also mentioned as possible disintegration aids.

Although neither of the last two prior-art documents cited above specifies the exact particle size distribution which suitable disintegrators  
5 are supposed to have, figures relating to the microcrystallinity of the cellulose and the particle fineness of the layer silicates suggest to the expert, above all in connection with the literature known from the production of pharmaceutical tablets, that conventional disintegrators are supposed to be used in fine-particle form. This is consistent with the fact  
10 that, hitherto, relatively coarse products obtained, for example, by granulation of fine powders, which are expressly marketed as tablet disintegrators, have not been commercially available.

European patent applications **EP-A-0 466 485**, **EP-A-0 522 766**, **EP-A-0 711 827**, **EP-A-0 711 828** and **EP-A-0 716 144** describe the production  
15 of deterrent tablets in which compacted particulate material with a particle size of 180 to 2000 µm is used. The resulting tablets may have both a homogeneous structure and a heterogeneous structure. According to EP-A-0 522 766, the surfactant- and builder-containing particles at least are coated with a solution or dispersion of a binder/disintegration aid, more  
20 particularly polyethylene glycol. Other binders/disintegration aids are the already repeatedly described and known disintegrating agents, for example starches and starch derivatives, commercially available cellulose derivatives, such as crosslinked and modified cellulose, microcrystalline cellulose fibers, crosslinked polyvinyl pyrrolidones, layered silicates, etc.  
25 Other suitable coating materials are weak acids, such as citric acid or tartaric acid which, in conjunction with carbonate-containing sources, lead to effervescent effects on contact with water and which, according to Römpf's definition, belong to the second class of disintegrating agents. In these cases, too, no specific details are provided as to the particle size  
30 distribution of the disintegrators. However, they are all applied to the

surface of granules. This is done either – as mentioned – in liquid to disperse form or in solid form. It is known to the expert in this connection that fine-particle solids, i.e. powder-like solids, which normally also contain relatively high percentages of dust, can be used for coating particles with particulate solids, so-called "powdering".

The proposed solutions mentioned in the foregoing produce the required result in the production of pharmaceutical tablets. Although, in the field of detergents and cleaning products, they contribute towards an improvement in the disintegration properties of washing- or cleaning-active tablets, the improvement achieved is inadequate in many cases. This applies in particular when the percentage of tacky organic substances in the tablets, for example anionic and/or nonionic surfactants, increases. In addition, the use of the disintegration aids in detergent shaped bodies can lead to specific problems which are entirely unknown in pharmaceutical products.

A particular problem arises from the use of cellulose as a disintegration aid in shaped bodies of detergents. If the primary particle size of the cellulose is too large, the problem of residue formation on the treated fabrics arises. On dark-colored fabrics in particular, deposits of the comparatively large cellulose primary particles, which are released from the disintegrator compactate in the wash liquor after the disintegration of the shaped body, can clearly be seen after drying.

As already known from pharmaceutical applications, a weak disintegrating effect is obtained where cellulose is incorporated in the shaped bodies solely in the form of a fine powder, so that disintegration aids and cellulose in particular are generally incorporated in the shaped bodies both in granular form and in powder form (cf. "**Angewandte Biopharmazie**" Wissenschaftliche Verlagsgesellschaft mbH Stuttgart, 1973, page 382). In the production of detergent shaped bodies, however, the additional incorporation of cellulose powder has proved unnecessary

and, in some cases, has even been found to hinder the disintegration of the shaped bodies. To produce cellulose-based granular disintegrators, cellulose powders with particle sizes above 150  $\mu\text{m}$  are normally compacted to form granules between 0.4 and 2.0 mm in size and are  
5 tabletted in this form with the other ingredients to form detergent shaped bodies (tablets).

To prevent residues being left on fabrics, it is advisable to use a finer particle cellulose where this problem does not arise. Unfortunately, a cellulose with primary particle sizes below 100  $\mu\text{m}$  cannot be compacted  
10 because the granules obtained are so unstable that they disintegrate on mixing with the other ingredients of the detergent tablets so that, ultimately, cellulose powder which does not have any significant disintegrating effect of its own is incorporated in the tablets.

Accordingly, the problem addressed by the present invention was to  
15 provide additive granules for detergent shaped bodies which, on the one hand, would not have the residue problem, but which on the other hand could be incorporated in granular form in the mixtures to be compressed without losing its effective shape. Another problem addressed by the present invention was to provide a process for the production of such  
20 disintegrator granules for incorporation in detergent shaped bodies.

It has now been found that the stability problems of disintegrator granules based on cellulose with particle sizes below 100  $\mu\text{m}$  can be avoided by granulating the cellulose together with microcrystalline cellulose or other ingredients of detergents.

25 In a first embodiment, therefore, the present invention relates to additive granules for detergent shaped bodies which contain

- a) 10 to 95% by weight of cellulose with particle sizes below 100  $\mu\text{m}$  and
- 30 b) 5 to 90% by weight of microcrystalline cellulose and/or one or more

ingredients of detergents.

Substances from the group of builders, bleaching agents and bleach  
activators, foam inhibitors and soil-release polymers are preferably used as  
5 the ingredients of detergents.

In the context of the present invention, additive granules are  
understood to be any additives and, in particular, disintegrators which are  
present per se in the form of fine-particle powders and which can be  
converted into a coarser particle form by spray drying, granulation,  
10 agglomeration, compacting, pelletizing or extrusion. They include not only  
disintegrators in granular form, but for example also those in co-granulated  
form.

In the context of the present invention, the terms "particle size" and  
"primary particle size" are synonymous where they are used to describe the  
15 cellulose in powder form. The granules obtained by granulation of the  
cellulose powder do of course have particle sizes which are larger than the  
primary particle size of the cellulose powder used. The term "particle size"  
or "primary particle size" in this regard means that the corresponding  
powders completely pass through a sieve with the indicated mesh width  
20 and leave behind less than 1% by weight of residue, based on the sieved  
powder, on the sieve.

The additive granules according to the present invention have a  
number of advantages which set them apart from conventional  
disintegrators. Thus, there are no residue problems on laundry which has  
25 been washed with detergent tablets containing the additive granules  
according to the invention. In quantitative terms also, laundry which has  
been washed with corresponding detergent tablets produces better  
reflectance values and is whiter and softer compared with laundry washed  
with detergent tablets containing cellulose granules of cellulose with  
30 primary particle sizes above 150  $\mu\text{m}$  as disintegrator for otherwise the



same composition.

The cellulose present as component a) in the additive granules according to the invention has the formal empirical composition  $(C_6H_{10}O_5)_n$  and, formally, is a  $\beta$ -1,4-polyacetal of cellobiose which, in turn, is made up of two molecules of glucose. Suitable celluloses consist of ca. 500 to 5,000 glucose units and, accordingly, have average molecular weights of 50,000 to 500,000. A particle size of the cellulose before granulation of less than 100  $\mu$ m is crucial to the invention, primary particle sizes below 70  $\mu$ m or below 50  $\mu$ m being preferred. According to the invention, cellulose derivatives obtainable from cellulose by polymer-analog reactions may also be used as component a). These chemically modified celluloses include, for example, products of esterification or etherification reactions in which hydroxy hydrogen atoms have been substituted. However, celluloses in which the hydroxy groups have been replaced by functional groups that are not attached by an oxygen atom may also be used as cellulose derivatives. The group of cellulose derivatives includes, for example, alkali metal celluloses, carboxymethyl cellulose (CMC), cellulose esters and ethers and aminocelluloses.

The cellulose derivatives mentioned are preferably not used as component a) on their own, but rather in the form of a mixture with cellulose. The content of cellulose derivatives in mixtures such as these is preferably below 50% by weight and more preferably below 20% by weight, based on component a). In a particularly preferred embodiment, pure cellulose free from cellulose derivatives is used as component a). In another particularly preferred embodiment, the granules contain 15 to 80% by weight, preferably 20 to 70% by weight and more preferably 25 to 60% by weight of cellulose with a particle size of less than 70  $\mu$ m and preferably less than 50  $\mu$ m as component a).

The additive granules according to the invention contain microcrystalline cellulose and/or the ingredients of detergents in quantities

of 5 to 90% by weight, based on the additive granules. These ingredients are preferably used in quantities of 10 to 70% by weight, more preferably in quantities of 20 to 60% by weight and most preferably in quantities of 30 to 50% by weight.

- 5           Microcrystalline cellulose may be used as sole component b) or as part of that component. This cellulose has primary particles sizes of ca. 5  $\mu\text{m}$  and was compacted to granules having an average particle size of 200  $\mu\text{m}$ . These compactates are stable, can be mixed with other substances without disintegrating into the primary particles and are capable in -  
10   conjunction with the fine-particle cellulose {component a)} of forming stable additive granules which remain stable when mixed with other substances. In this way, it is possible in accordance with the present invention to produce completely cellulose-based additive granules which are not attended by the residue problem of conventional cellulose disintegrators.  
15   In the wash liquor, these additive granules disintegrate into the primary particles so that no cellulose particles larger than 100  $\mu\text{m}$  in size remain in the wash liquor. According to the present invention, preferred additive granules are those which contain 5 to 70% by weight, preferably 10 to 60% by weight and more preferably 20 to 50% by weight of microcrystalline  
20   cellulose, based on the additive granules, as component b).

- The additive granules according to the invention may contain any typical detergent ingredients as the ingredients of detergents {sole component b) or part of component b)}, the use of auxiliaries which, besides their function of stabilizing the cellulose-containing granules, also  
25   perform other functions in the washing process being preferred. The detergent ingredients present in the additive granules according to the invention are preferably selected from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers.

- Preferred components b) from this group are the bleaching agents  
30   and bleach activators, additive granules containing 10 to 70% by weight,

preferably 20 to 60% by weight and more preferably 30 to 50% by weight of a bleaching agent or bleach activator as component b) being preferred. Preferred additive granules contain the bleach activator tetraacetyl ethylenediamine (TAED) as part of component b) or as the sole ingredient of component b).

The additive granules according to the invention preferably contain no particles smaller than 0.1 mm in size (fines) and, in one preferred embodiment, contain in all only 0 to 5% by weight of particles with particle sizes below 0.2 mm. At least 90% by weight of preferred granules consist of particles at least 0.3 mm to at most 2.0 mm in size.

In another embodiment, the present invention relates to a process for the production of the additive granules according to the invention in which

- a) 10 to 95% by weight of cellulose with particle sizes below 100  $\mu\text{m}$  and
- b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents

are granulated under compacting conditions.

To this end, components a) and b) are mixed, the cellulose having to satisfy the above-mentioned particle size criteria in view of the residue problem whereas component b) is not subject to any particle size limitations. In the interest of intensive and homogeneous mixing of the two components, however, it can be of advantage to grind component b) before the compacting step to particle size ranges below 1 mm, more particularly below 500  $\mu\text{m}$  and, in one particularly preferred embodiment, below 200  $\mu\text{m}$ .

The granulation process under compacting conditions may be carried out by any of the processes known to the expert, various machines

being suitable for carrying out the process according to the invention. In the context of the present invention, granulation under compacting conditions may be equated with such terms as granulation, agglomeration, compacting, extrusion and pelletizing.

5           Suitable machines for carrying out the process according to the invention are, for example, mixers of various types such as, for example, Series R or RV Eirich® mixers (trade marks of Maschinenfabrik Gustav Eirich, Hardheim), Fukae® FS-G mixers (trade marks of Fukae Powtech, Kogyo Co., Japan), Lödige® FM, KM and CB mixers (trade marks of Lödige  
10 Maschinenbau GmbH, Paderborn) and Series T or K-T Drais® mixers (trade marks of Drais-Werke GmbH, Mannheim). Other suitable granulating machines are pellet presses which, in preferred embodiments, are used as annular die presses. Roller compacting has proved to be particularly advantageous and is particularly preferred for the purposes of  
15 the invention. In roller compacting, the dry mixture of components a) and b) is compacted by two contrarotating rollers to form a sheet-form compactate which is subsequently size-reduced by grinding and sieving to form granules with particle sizes below 2 mm.

          The ingredients of detergents preferably used as component b) are  
20 briefly described in the following, the substances from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers being described in that order.

          Silicates, aluminium silicates (especially zeolites), carbonates, salts of organic di- and polycarboxylic acids and mixtures of these substances  
25 are mentioned in particular as builders which may be present as sole component b) or as an ingredient of component b) in the additive granules according to the invention and in the process for producing them.

          Suitable crystalline layer-form sodium silicates correspond to the general formula  $\text{Na}_2\text{MSi}_x\text{O}_{2x+1} \cdot \text{H}_2\text{O}$ , where M is sodium or hydrogen, x is a  
30 number of 1.9 to 4 and y is a number of 0 to 20, preferred values for x

being 2, 3 or 4. Crystalline layer silicates such as these are described, for example, in European patent application **EP-A-0 164 514**. Preferred crystalline layer silicates corresponding to the above formula are those in which M is sodium and x assumes the value 2 or 3. Both  $\beta$ - and  $\delta$ -sodium disilicates  $\text{Na}_2\text{Si}_2\text{O}_5 \cdot y \text{H}_2\text{O}$  are particularly preferred,  $\beta$ -sodium disilicate being obtainable, for example, by the process described in International patent application **WO-A- 91/08171**.

Other useful builders are amorphous sodium silicates with a modulus ( $\text{Na}_2\text{O}:\text{SiO}_2$  ratio) of 1:2 to 1:3.3, preferably 1:2 to 1:2.8 and more preferably 1:2 to 1:2.6 which dissolve with delay and exhibit multiple wash cycle properties. The delay in dissolution in relation to conventional amorphous sodium silicates can have been obtained in various ways, for example by surface treatment, compounding, compacting or by overdrying. In the context of the invention, the term "amorphous" is also understood to encompass "X-ray amorphous". In other words, the silicates do not produce any of the sharp X-ray reflexes typical of crystalline substances in X-ray diffraction experiments, but at best one or more maxima of the scattered X-radiation which have a width of several degrees of the diffraction angle. However, particularly good builder properties may even be achieved where the silicate particles produce crooked or even sharp diffraction maxima in electron diffraction experiments. This may be interpreted to mean that the products have microcrystalline regions between 10 and a few hundred nm in size, values of up to at most 50 nm and, more particularly, up to at most 20 nm being preferred. So-called X-ray amorphous silicates such as these, which also dissolve with delay in relation to conventional waterglasses, are described for example in German patent application **DE-A-44 00 024**. Compacted amorphous silicates, compounded amorphous silicates and overdried X-ray-amorphous silicates are particularly preferred.

The finely crystalline, synthetic zeolite containing bound water used

in accordance with the invention is preferably zeolite A and/or zeolite P. Zeolite MAP® (Crosfield) is a particularly preferred P-type zeolite. However, zeolite X and mixtures of A, X and/or P are also suitable. The zeolite may be used as a spray-dried powder or even as an undried  
5 suspension still moist from its production. If the zeolite is used in the form of a suspension, the suspension may contain small additions of nonionic surfactants as stabilizers, for example 1 to 3% by weight, based on zeolite, of ethoxylated C<sub>12-18</sub> fatty alcohols containing 2 to 5 ethylene oxide groups, C<sub>12-14</sub> fatty alcohols containing 4 to 5 ethylene oxide groups or ethoxylated  
10 isotridecanols. Suitable zeolites have a mean particle size of less than 10 µm (volume distribution, as measured by the Coulter Counter Method) and contain preferably 18 to 22% by weight and more preferably 20 to 22% by weight of bound water.

The generally known phosphates may of course also be used as  
15 builders providing their use should not be avoided on ecological grounds. The sodium salts of the orthophosphates, the pyrophosphates and, in particular, the tripolyphosphates are particularly suitable.

Useful organic builders are, for example, the polycarboxylic acids usable, for example, in the form of their sodium salts, such as citric acid,  
20 adipic acid, succinic acid, glutaric acid, tartaric acid, sugar acids, amino-carboxylic acids, nitrilotriacetic acid (NTA), providing their use is not ecologically unsafe, and mixtures thereof. Preferred salts are the salts of the polycarboxylic acids, such as citric acid, adipic acid, succinic acid, glutaric acid, tartaric acid, sugar acids and mixtures thereof.

25 Among the compounds yielding H<sub>2</sub>O<sub>2</sub> in water which serve as bleaching agents, sodium perborate tetrahydrate and sodium perborate monohydrate are particularly important. Other useful bleaching agents are, for example, sodium percarbonate, peroxyphosphates, citrate perhydrates and H<sub>2</sub>O<sub>2</sub>-yielding peracidic salts or peracids, such as  
30 perbenzoates, peroxophthalates, diperazelaic acid, phthaliminoperacid or

diperdodecane dioic acid.

In order to obtain an improved bleaching effect where washing is carried out at temperatures of 60°C or lower, bleach activators may be incorporated as sole component b) or as an ingredient of component b).

- 5 The bleach activators may be compounds which form aliphatic peroxocarboxylic acids containing preferably 1 to 10 carbon atoms and more preferably 2 to 4 carbon atoms and/or optionally substituted perbenzoic acid under perhydrolysis conditions. Substances bearing O- and/or N-acyl groups with the number of carbon atoms mentioned and/or
- 10 optionally substituted benzoyl groups are suitable. Preferred bleach activators are polyacylated alkylenediamines, more particularly tetraacetyl ethylenediamine (TAED), acylated triazine derivatives, more particularly 1,5-diacetyl-2,4-dioxohexahydro-1,3,5-triazine (DADHT), acylated glycolurils, more particularly tetraacetyl glycoluril (TAGU), N-acylimides, more
- 15 particularly N-nonanoyl succinimide (NOSI), acylated phenol sulfonates, more particularly n-nonanoyl or isononanoyloxybenzenesulfonate (n- or iso-NOBS), carboxylic anhydrides, more particularly phthalic anhydride, acylated polyhydric alcohols, more particularly triacetin, ethylene glycol diacetate and 2,5-diacetoxy-2,5-dihydrofuran.

- 20 In addition to or instead of the conventional bleach activators mentioned above, so-called bleach catalysts may also be incorporated in the shaped bodies. Bleach catalysts are bleach-boosting transition metal salts or transition metal complexes such as, for example, manganese-, iron-, cobalt-, ruthenium- or molybdenum-salen complexes or carbonyl
- 25 complexes. Manganese, iron, cobalt, ruthenium .....titanium, vanadium and copper complexes with nitrogen-containing tripod ligands and cobalt-, iron-, copper- and ruthenium-ammine complexes may also be used as bleach catalysts.

- Suitable foam inhibitors – which may form part of component b) or
- 30 may be used on their own as component b) - are, for example, soaps of

natural or synthetic origin which have a high percentage content of C<sub>18-24</sub> fatty acids. Suitable non-surface-active foam inhibitors are, for example, organopolysiloxanes and mixtures thereof with microfine, optionally silanized, silica or bis-stearyl ethylenediamide. Mixtures of different foam  
5 inhibitors, for example mixtures of silicones, paraffins and waxes, may also be used with advantage. The foam inhibitors are preferably fixed to a granular water-soluble or water-dispersible support. Mixtures of paraffins and bis-stearyl ethylenediamides are particularly preferred.

In addition, the detergents according to the invention may also  
10 contain components with a positive effect on the removability of oil and fats from textiles by washing (so-called soil repellents) as component b) or as part of component b). This effect becomes particularly clear when a textile which has already been repeatedly washed with a detergent according to the invention containing this oil- and fat-dissolving component is soiled.  
15 Preferred oil- and fat-dissolving components include, for example, nonionic cellulose ethers, such as methyl cellulose and methyl hydroxypropyl cellulose containing 15 to 30% by weight of methoxyl groups and 1 to 15% by weight of hydroxypropoxyl groups, based on the nonionic cellulose ether, and the polymers of phthalic acid and/or terephthalic acid known  
20 from the prior art or derivatives thereof, more particularly polymers of ethylene terephthalates and/or polyethylene glycol terephthalates or anionically and/or nonionically modified derivatives thereof. Of these, the sulfonated derivatives of phthalic acid and terephthalic acid polymers are particularly preferred. According to the invention, carboxymethyl starch  
25 (CMS) may also be used as component b) or as part of component b).

In another embodiment, the present invention relates to the use of the additive granules according to the invention for detergent shaped bodies as disintegration accelerators in such shaped bodies, more particularly detergent tablets.

30 Accordingly, the present invention also relates to detergent shaped



bodies, more particularly detergent tablets, which contain from 1 to 40% by weight, preferably from 2.5 to 30% by weight and more preferably from 5 to 20% by weight of the additive granules according to the invention.

These shaped bodies are produced by mixing the detergent  
5 granules with the other ingredients of the detergent and then compressing the resulting mixture in dies.

The shaped bodies can be made in predetermined three-dimensional forms and predetermined sizes. Suitable three-dimensional forms are virtually any easy-to-handle forms including, for example, slabs  
10 or bars, cubes, squares and corresponding three-dimensional elements with flat sides and, more particularly, cylindrical forms with a circular or oval cross-section. This particular three-dimensional form encompasses tablets and compact cylinders with a height-to-diameter ratio of more than 1.

The portioned shaped bodies may be formed as separate individual  
15 elements which correspond to a predetermined dose of the detergent. However, it is also possible to form shaped bodies which combine several such units in a single shaped body, individual portioned units being easy to break off in particular through the provision of predetermined weak spots. For the use of laundry detergents in machines of the standard European  
20 type with horizontally arranged mechanics, it can be of advantage to produce the portioned shaped bodies as cylindrical or square tablets, preferably with a diameter-to-height ratio of about 0.5:2 to 2:0.5. Commercially available hydraulic presses, eccentric presses and rotary presses are particularly suitable for the production of shaped bodies such  
25 these.

The three-dimensional form of another embodiment of the shaped bodies according to the invention is adapted in its dimensions to the dispensing compartment of commercially available domestic washing machines, so that the shaped bodies can be introduced directly, i.e. without  
30 a dosing aid, into the dispensing compartment where they dissolve on

contact with water. However, it is of course readily possible - and preferred in accordance with the present invention - to use the detergent shaped bodies in conjunction with a dosing aid.

Another preferred shaped body which can be produced has a plate-like or slab-like structure with alternately thick long segments and thin short segments, so that individual segments can be broken off from this "bar" at the predetermined weak spots, which the short thin segments represent, and introduced into the machine. This "bar" principle can also be embodied in other geometric forms, for example vertical triangles which are only joined to one another at one of their longitudinal sides.

In another possible embodiment, however, the various components are not compressed to form a single tablet, instead the shaped bodies obtained comprise several layers, i.e. at least two layers. These various layers may have different dissolving rates. This can provide the shaped bodies with favorable performance properties. If, for example, the shaped bodies contain components which adversely affect one another, one component may be integrated in the more quickly dissolving layer while the other component may be incorporated in a more slowly dissolving layer so that the first component can already have reacted off by the time the second component dissolves. The various layers of the shaped bodies can be arranged in the form of a stack, in which case the inner layer(s) dissolve at the edges of the shaped body before the other layers have completely dissolved. Alternatively, however, the inner layer(s) may also be completely surrounded by the layers lying further to the outside which prevents constituents of the inner layer(s) from dissolving prematurely.

In another preferred embodiment of the invention, a shaped body consists of at least three layers, i.e. two outer layers and at least one inner layer, a peroxy bleaching agent being present in at least one of the inner layers whereas, in the case of the stack-like tablet, the two cover layers and, in the case of the envelope-like tablet, the outermost layers are free

from peroxy bleaching agent. In another possible embodiment, peroxy bleaching agent and any bleach activators or bleach catalysts present and/or enzymes may be spatially separated from one another in one and the same shaped body. Multilayer shaped bodies such as these have the advantage that they can be used not only via a dispensing compartment or via a dosing unit which is added to the wash liquor, instead it is also possible in cases such as these to introduce the shaped body into the machine in direct contact with the fabrics without any danger of spotting by bleaching agent or the like.

10        Similar effects can also be obtained by coating individual constituents of the detergent composition to be compressed or the shaped body as a whole. To this end, the shaped bodies to be coated may be sprayed, for example, with aqueous solutions or emulsions or a coating may be obtained by the process known as melt coating.

15        In addition to the additive granules according to the invention which facilitate and accelerate the disintegration of the detergent shaped bodies, the shaped bodies according to the invention may contain all the usual ingredients of detergents. If additive granules according to the invention containing certain detergent ingredients as component b) are used, there is no need to add those ingredients during the production of the shaped body. However, it may even be preferred to incorporate those detergent ingredients both as component b) in the additive granules and also in the shaped body. Besides the ingredients already mentioned as part of the additive granules, the shaped bodies according to the invention may contain other components which are not introduced into the shaped body through the additive granules. Surfactants and enzymes in particular are mentioned as deterative substances which are incorporated in the shaped bodies.

25        Anionic, nonionic, cationic and/or amphoteric surfactants may be used in the detergent shaped bodies according to the invention. From the

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performance point of view, it is preferred to use mixtures of anionic and nonionic surfactants in which the percentage content of anionic surfactants should be greater than that of the nonionic surfactants. The total surfactant content of the shaped bodies is between 5 and 60% by weight, based on  
5 the weight of the shaped body, surfactant contents of more than 15% by weight being preferred.

Suitable anionic surfactants are, for example, those of the sulfonate and sulfate type. Suitable surfactants of the sulfonate type are preferably C<sub>9-13</sub> alkyl benzenesulfonates, olefin sulfonates, i.e. mixtures of alkenes and  
10 hydroxyalkane sulfonates, and the disulfonates obtained, for example, from C<sub>12-18</sub> monoolefins with an internal or terminal double bond by sulfonation with gaseous sulfur trioxide and subsequent alkaline or acidic hydrolysis of the sulfonation products. Other suitable surfactants of the sulfonate type are the alkane sulfonates obtained from C<sub>12-18</sub> alkanes, for example by  
15 sulfochlorination or sulfoxidation and subsequent hydrolysis or neutralization. The esters of  $\alpha$ -sulfofatty acids (ester sulfonates), for example the  $\alpha$ -sulfonated methyl esters of hydrogenated coconut oil, palm kernel oil or tallow fatty acids, are also suitable.

Other suitable anionic surfactants are sulfonated fatty acid glycerol  
20 esters. Fatty acid glycerol esters in the context of the present invention are the monoesters, diesters and triesters and mixtures thereof which are obtained where production is carried out by esterification of a monoglycerol with 1 to 3 moles of fatty acid or in the transesterification of triglycerides with 0.3 to 2 moles of glycerol. Preferred sulfonated fatty acid glycerol  
25 esters are the sulfonation products of saturated fatty acids containing 6 to 22 carbon atoms, for example caproic acid, caprylic acid, capric acid, myristic acid, lauric acid, palmitic acid, stearic acid or behenic acid.

Preferred alk(en)yl sulfates are the alkali metal salts and, in particular, the sodium salts of the sulfuric acid semiesters of C<sub>12-18</sub> fatty  
30 alcohols, for example cocofatty alcohol, tallow fatty alcohol, lauryl, myristyl,

cetyl or stearyl alcohol, or C<sub>10-20</sub> oxoalcohols and the corresponding semiesters of secondary alcohols with the same chain length. Other preferred alk(en)yl sulfates are those with the chain length mentioned which contain a synthetic, linear alkyl chain based on a petrochemical and  
5 which are similar in their degradation behavior to the corresponding compounds based on oleochemical raw materials. C<sub>12-16</sub> alkyl sulfates, C<sub>12-15</sub> alkyl sulfates and C<sub>14-15</sub> alkyl sulfates are preferred from the point of view of washing technology. Other suitable anionic surfactants are 2,3-alkyl sulfates which may be produced, for example, in accordance with US  
10 3,234,258 or US 5,075,041 and which are commercially obtainable as products of the Shell Oil Company under the name of DAN®.

The sulfuric acid monoesters of linear or branched C<sub>7-21</sub> alcohols ethoxylated with 1 to 6 moles of ethylene oxide, such as 2-methyl-branched C<sub>9-11</sub> alcohols containing on average 3.5 moles of ethylene oxide (EO) or  
15 C<sub>12-18</sub> fatty alcohols containing 1 to 4 EO, are also suitable. In view of their high foaming capacity, they are only used in relatively small quantities, for example in quantities of 1 to 5% by weight, in detergents.

Other preferred anionic surfactants are the salts of alkyl sulfosuccinic acid which are also known as sulfosuccinates or as  
20 sulfosuccinic acid esters and which represent monoesters and/or diesters of sulfosuccinic acid with alcohols, preferably fatty alcohols and, more particularly, ethoxylated fatty alcohols. Preferred sulfosuccinates contain C<sub>8-18</sub> fatty alcohol residues or mixtures thereof. Particularly preferred sulfosuccinates contain a fatty alcohol moiety derived from ethoxylated fatty  
25 alcohols which, considered in isolation, represent nonionic surfactants (for a description, see below). Of these sulfosuccinates, those of which the fatty alcohol moieties are derived from narrow-range ethoxylated fatty alcohols are particularly preferred. Alk(en)yl succinic acid preferably containing 8 to 18 carbon atoms in the alk(en)yl chain or salts thereof may  
30 also be used.

Other suitable anionic surfactants are, in particular, soaps. Suitable soaps are saturated fatty acid soaps, such as the salts of lauric acid, myristic acid, palmitic acid, stearic acid, hydrogenated erucic acid and behenic acid, and soap mixtures derived in particular from natural fatty acids, for example coconut oil, palm kernel oil or tallow fatty acids.

The anionic surfactants, including the soaps, may be present in the form of their sodium, potassium or ammonium salts and as soluble salts of organic bases, such as mono-, di- or triethanolamine. The anionic surfactants are preferably present in the form of their sodium or potassium salts and, more preferably, in the form of their sodium salts.

Preferred nonionic surfactants are alkoxylated, advantageously ethoxylated, more especially primary alcohols preferably containing 8 to 18 carbon atoms and, on average, 1 to 12 moles of ethylene oxide (EO) per mole of alcohol, in which the alcohol radical may be linear or, preferably, methyl-branched in the 2-position or may contain linear and methyl-branched radicals in the form of the mixtures typically present in oxoalcohol radicals. However, alcohol ethoxylates containing linear radicals of alcohols of native origin with 12 to 18 carbon atoms, for example coconut oil, palm oil, tallow fatty or oleyl alcohol, and on average 2 to 8 EO per mole of alcohol are particularly preferred. Preferred ethoxylated alcohols include, for example, C<sub>12-14</sub> alcohols containing 3 EO or 4 EO, C<sub>9-11</sub> alcohol containing 7 EO, C<sub>13-15</sub> alcohols containing 3 EO, 5 EO, 7 EO or 8 EO, C<sub>12-18</sub> alcohols containing 3 EO, 5 EO or 7 EO and mixtures thereof, such as mixtures of C<sub>12-14</sub> alcohol containing 3 EO and C<sub>12-18</sub> alcohol containing 5 EO. The degrees of ethoxylation mentioned represent statistical mean values which, for a special product, can be a whole number or a broken number. Preferred alcohol ethoxylates have a narrow homolog distribution (narrow range ethoxylates, NRE). In addition to these nonionic surfactants, fatty alcohols containing more than 12 EO may also be used, examples including tallow fatty alcohol containing 14 EO, 25 EO, 30 EO or 40 EO.

In addition, alkyl glycosides corresponding the general formula  $RO(G)_x$  where R is a primary, linear or methyl-branched, more particularly 2-methyl-branched, aliphatic radical containing 8 to 22 and preferably 12 to 18 carbon atoms and G stands for a glucose unit containing 5 or 6 carbon atoms, preferably glucose, may also be used as further nonionic surfactants. The degree of oligomerization x, which indicates the distribution of monoglycosides and oligoglycosides, is between 1 and 10 and preferably between 1.2 and 4.

Another class of preferred nonionic surfactants which may be used either as sole nonionic surfactant or in combination with other nonionic surfactants are alkoxyated, preferably ethoxylated or ethoxylated and propoxylated, fatty acid alkyl esters preferably containing 1 to 4 carbon atoms in the alkyl chain, more especially the fatty acid methyl esters which are described, for example, in Japanese patent application JP 58/217598 or which are preferably produced by the process described in International patent application WO-A-90/13533.

Nonionic surfactants of the amine oxide type, for example N-cocoalkyl-N,N-dimethylamine oxide and N-tallowalkyl-N,N-dihydroxyethylamine oxide, and the fatty acid alkanolamide type are also suitable. The quantity in which these nonionic surfactants are used is preferably no more than the quantity in which the ethoxylated fatty alcohols are used and, more preferably, no more than half that quantity.

Other suitable surfactants are polyhydroxyfatty acid amides corresponding to formula (I):



in which RCO is an aliphatic acyl group containing 6 to 22 carbon atoms,  $R^1$  is hydrogen, an alkyl or hydroxyalkyl group containing 1 to 4 carbon atoms and [Z] is a linear or branched polyhydroxyalkyl group containing 3

to 10 carbon atoms and 3 to 10 hydroxyl groups. The polyhydroxyfatty acid amides are known substances which may normally be obtained by reductive amination of a reducing sugar with ammonia, an alkylamine or an alkanolamine and subsequent acylation with a fatty acid, a fatty acid alkyl ester or a fatty acid chloride.

The group of polyhydroxyfatty acid amides also includes compounds corresponding to formula (II):



in which R is a linear or branched alkyl or alkenyl group containing 7 to 12 carbon atoms, R<sup>1</sup> is a linear, branched or cyclic alkyl group or an aryl group containing 2 to 8 carbon atoms and R<sup>2</sup> is a linear, branched or cyclic alkyl group or an aryl group or an oxyalkyl group containing 1 to 8 carbon atoms, C<sub>1-4</sub> alkyl or phenyl groups being preferred, and [Z] is a linear polyhydroxy-alkyl group, of which the alkyl chain is substituted by at least two hydroxyl groups, or alkoxyated, preferably ethoxyated or propoxyated, derivatives of that group.

[Z] is preferably obtained by reductive amination of a reduced sugar, for example glucose, fructose, maltose, lactose, galactose, mannose or xylose. The N-alkoxy- or N-aryloxy-substituted compounds may then be converted into the required polyhydroxyfatty acid amides by reaction with fatty acid methyl esters in the presence of an alkoxide as catalyst, for example in accordance with the teaching of International patent application **WO-A-95/07331**.

Suitable enzymes are those from the class of proteases, lipases, amylases, cellulases or mixtures thereof. Enzymes obtained from bacterial strains or fungi, such as *Bacillus subtilis*, *Bacillus licheniformis* and *Streptomyces griseus*, are particularly suitable. Proteases of the subtilisin type are preferred, proteases obtained from *Bacillus lentus* being



particularly preferred. Enzyme mixtures, for example of protease and amylase or protease and lipase or protease and cellulase or of cellulase and lipase or of protease, amylase and lipase or of protease, lipase and cellulase, but especially cellulase-containing mixtures, are of particular  
5 interest. Peroxidases or oxidases have also proved to be suitable in some cases. The enzymes may be adsorbed to supports and/or encapsulated in shell-forming substances to protect them against premature decomposition. The percentage content of the enzymes, enzyme mixtures or enzyme granules in the shaped bodies according to the invention may be, for  
10 example, from about 0.1 to 10% by weight and is preferably from 0.5 to about 5% by weight.

The shaped bodies may contain derivatives of diamino-stilbenedisulfonic acid or alkali metal salts thereof as optical brighteners. Suitable optical brighteners are, for example, salts of 4,4'-bis-(2-anilino-4-  
15 morpholino-1,3,5-triazinyl-6-amino)-stilbene-2,2'-disulfonic acid or compounds of similar composition which contain a diethanolamino group, a methylamino group, an anilino group or a 2-methoxyethylamino group instead of the morpholino group. Brighteners of the substituted diphenyl styryl type, for example alkali metal salts of 4,4'-bis-(2-sulfostyryl)-diphenyl,  
20 4,4'-bis-(4-chloro-3-sulfostyryl)-diphenyl or 4-(4-chlorostyryl)-4'-(2-sulfostyryl)-diphenyl, may also be present. Mixtures of the brighteners mentioned above may also be used.

The invention can also make use of the fact that acidifying agents, such as citric acid, tartaric acid or succinic acid, and also acidic salts of  
25 inorganic acids ("hydrogen salts"), for example bisulfates, above all in combination with carbonate-containing systems, can also contribute towards improving the disintegration properties of the shaped bodies. According to the invention, however, these acidifying agents are also used in the form of coarse particles, more particularly granules, which are  
30 substantially free from dust and which are adapted in their particle size

distribution to the additive granules. The granular acidifying agents may be present in the shaped bodies, for example, in quantities of 1 to 10% by weight.

The shaped bodies according to the invention, more especially the  
5 hitherto poorly disintegrating and poorly soluble detergent tablets and bleach tablets, have outstanding disintegration properties through the use of the additive granules according to the invention. A broader distribution of the additive granules throughout the shaped body is achieved by the compacting of the disintegration aid with a detergent ingredient. The  
10 improved disintegration can be tested, for example, under critical conditions in a normal domestic washing machine (bleach/detergent tablet used directly in the wash liquor with the aid of a conventional dispenser, delicates program or colors program, washing temperature max. 40°C) or in a glass beaker at a water temperature of 25°C. The carrying out of the  
15 corresponding tests is described in the Examples. Under these conditions, the shaped bodies according to the invention not only disintegrate completely in 10 minutes, the preferred embodiments have disintegration times in the glass beaker test of less than 3 minutes and, more particularly, less than 2 minutes. Particularly advantageous embodiments even have  
20 disintegration times of less than 1 minute. Disintegration times of less than 3 minutes in the glass beaker test are sufficient to ensure that the detergent shaped bodies or detergent additive shaped bodies are flushed into the wash liquor from the dispensing compartment of conventional domestic washing machines. In another embodiment, therefore, the  
25 present invention relates to a washing process in which the shaped bodies are introduced into the wash liquor from the dispensing compartment of a domestic washing machine. The dissolving time of the shaped bodies in the washing machine is preferably less than 8 minutes and more preferably less than 5 minutes.

30 The actual production of the shaped bodies according to the

invention is carried out by initially dry mixing the disintegrator granules with the other constituents and then shaping the resulting mixture, more particularly by compression, into tablets using conventional processes (for example as described in the conventional patent literature on tableting, above all in the field of detergents of cleaners, more particularly as described in the above-cited patent applications and in the article entitled **"Tablettierung: Stand der Technik"** in **SÖFW Journal**, Vol. 122, pages 1016-1021 (1996).

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### Examples

Additive granules 1, 2 and 3 according to the invention and comparison granules 4, 5 and 6, which had the composition shown in Table 1, were produced by roller compacting and subsequent grinding and sieving.

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The comparison granules contained either an unsuitable component a) (overly large primary particle size, Example 4), unsuitable components b) (Example 6: additional effervescent system which is not a typical ingredient of detergents) or no component b) at all (Example 5).

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In the case of Comparison Example 5, stable granules could not be obtained. Even before the tableting process, the "granules" obtained disintegrated into the primary particles when mixed with the other ingredients. In another comparison, non-granulated cellulose in the form of a fine powder (50  $\mu\text{m}$ ), which produced completely the same tablet hardness and disintegration time values (Table 3) as comparison granules

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5, were used from the outset.

**Table 1:**

Additive granules [% by weight]

Additive granules	1	2	3	4	5	6
Cellulose (primary particle size 50 µm)	80%	50%	40%		100%	40%
Cellulose (primary particle size 150 µm)				100%		
Granules of microcr. cellulose (FMC)		50%	10%			10%
NaHCO <sub>3</sub>						28.2%
Citric acid, water-free						21.8%
Carboxymethyl starch	20%					
TAED			50%			

The additive granules produced in this way were mixed with other components to form a detergent, a powder with the following composition being used as the basic granules:

**Table 2:**

Basic granules [% by weight]

	Quantity
C <sub>9-13</sub> Alkyl benzenesulfonate	15.4
C <sub>13-15</sub> Oxoalcohol · 3 to 7 EO	7.9
Soap	1.0
Optical brightener	0.2
Sodium carbonate	13.9
Sodium silicate	4.3
Co-builder H40	4.9
HEDP	0.6
Zeolite A (water-free active substance)	25.5
Na perborate monohydrate	18.3
Water	8.0

Co-builder H40 is an acrylic acid/maleic acid copolymer available from Stockhausen.

HEDP is the sodium salt of hydroxyethane-1,1-diphosphonic acid.

The mixed detergents were then tabletted in a tablet press. The hardness of the tablets was measured by deforming a tablet until it broke, the force being applied to the sides of the tablet and the maximum force which the tablet withstood being determined.

To determine tablet disintegration, a tablet was placed in a glass beaker filled with water (600 ml water, temperature 25°C) and the time which the tablet took to disintegrate completely was measured.

The composition of the tablets and the experimental data are shown in Table 3 below:

**Table 3:**

Detergent tablets [composition in % by weight]

Tablet	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6
Additive	5%	4%	10%	4%	4%	8%
Basic granules	81.25%	82.25%	81.25%	82.25%	82.25%	78.25%
Enzyme	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
TAED	7%	7%	2%	7%	7%	7%
Foam inhibitor	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Soil-release polymer	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
Tablet hardness	33 N	20 N	30-35 N	30-35 N	25 N	25 N
Tablet disintegration	20 secs.	58 secs.	5-10 secs.	5-10 secs.	>5 mins.	>5 mins.

Comparison Example 4 produces results comparable with Examples 1, 2 and 3 according to the invention both in regard to tablet hardness and

in regard to disintegration time. To demonstrate the superiority of the additive granules according to the invention in detergent shaped bodies, the following washing tests were carried out:

Two 40 g tablets were placed in the dispensing compartment of a washing machine. The machine was loaded with 3.5 kg of dark blue terry towels and operated under the following conditions: tap water with a hardness of 23°d (equivalent to 230 mg CaO/l), washing temperature 60°C, liquor ratio (kg washing : liter wash liquor in the main wash cycle) 1:5.7, three rinses with tap water, spinning and drying. After 10 washes, the dried towels were evaluated according to the following criteria:

- score 1: satisfactory, no discernible residues
- score 2: acceptable, isolated, harmless residues
- score 3: discernible residues problematical on critical evaluation
- 15 score 4: clearly discernible and problematical residues in an increasing number and quantity

In addition, the dispensing compartment was opened after the wash process and visually evaluated with the following results:

- 20 score 1: satisfactory, no discernible residues, completely flushed in
- score 2: acceptable, isolated, harmless residues, very finely distributed
- score 3: discernible residues problematical on critical evaluation
- 25 score 4: clearly discernible and problematical residues in an increasing number and quantity, agglomeration and lump formation

The individual detergent tablets were evaluated as follows:

**Table 4:**

Visual evaluation of residue behavior

Tablet	1	2	3	4	5	6
Dried towel	2	2	2	5	*	*
Dispensing compartment	1	1	1	1	>10	>10
Total	3	3	3	6	>10	>10

Tablets 1, 2 and 3 according to the invention produce the best residue results through the use of the fine-particle cellulose in conjunction with very good tablet disintegration (see Table 3). Comparison Example 4, which is also characterized by a good disintegration rate (see Table 3), does not perform nearly as well as a result of the use of the cellulose with a primary particle size of 150  $\mu\text{m}$ . The cellulose residues on the towels can clearly be seen as problematical residues.

\*) Due to their extremely long disintegration times, tablets 5 and 6 do not disintegrate in the dispensing compartment and cannot be flushed into the wash process from the dispensing compartment of the washing machine. After the washing process, the tablets are still present almost intact in the dispensing compartment, with the result that no residues can be seen on the washed towels.

**CLAIMS**

1. Additive granules for detergent shaped bodies, characterized by a content of
  - a) 10 to 95% by weight of cellulose having particle sizes below 100  $\mu\text{m}$  and
  - b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers.
2. Additive granules as claimed in claim 1, characterized in that the microcrystalline cellulose and/or the ingredients of detergents are present in the granules in quantities of 10 to 70% by weight, preferably in quantities of 20 to 60% by weight and more preferably in quantities of 30 to 50% by weight, based on the additive granules.
3. Additive granules as claimed in claim 1 or 2, characterized in that 5 to 70% by weight, preferably 10 to 60% by weight and more preferably 20 to 50% by weight of microcrystalline cellulose, based on the auxiliary granules, are present as component b) in the granules.
4. Additive granules as claimed in claim 1 or 2, characterized in that 10 to 70% by weight, preferably 20 to 60% by weight and more preferably 30 to 50% by weight of a bleaching agent or bleach activator is used as component b).
5. Additive granules as claimed in claim 4, characterized in that tetraacetyl ethylenediamine (TAED) is used as the bleach activator.
6. Additive granules as claimed in any of claims 1 to 5, characterized in that 15 to 80% by weight, preferably 20 to 70% by weight and more preferably 25 to 60% by weight of cellulose with a particle size below 70  $\mu\text{m}$  and preferably below 50  $\mu\text{m}$  is used as component a).
7. A process for the production of the additive granules for detergent shaped bodies claimed in any of claims 1 to 7, characterized in that



- a) 10 to 95% by weight of cellulose with particle sizes below 100  $\mu\text{m}$  and
- b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers

are granulated under compacting conditions.

8. A process as claimed in claim 7, characterized in that

- a) 10 to 95% by weight of cellulose with particle sizes below 100  $\mu\text{m}$  and
- b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers

are converted by roller compacting into a sheet-form compactate which is then size-reduced by grinding and sieving to granules with particle sizes below 2 mm.

9. The use of the additive granules for detergent shaped bodies claimed in any of claims 1 to 6 as a disintegration accelerator in detergent shaped bodies, more particularly detergent tablets.

10. Detergent shaped bodies, more particularly detergent tablets, containing 1 to 40% by weight, preferably 2.5 to 30% by weight and more preferably 5 to 20% by weight of the additive granules claimed in any of claims 1 to 6.

11. A washing process using the shaped body claimed in claim 10, characterized in that the shaped body is introduced into the wash liquor from the dispensing compartment of a domestic washing machine.

**Abstract**

Additive granules for detergent shaped bodies, characterized by a content of

- a) 10 to 95% by weight of cellulose having particle sizes below 100  $\mu\text{m}$  and
- b) 5 to 90% by weight of microcrystalline cellulose and/or one or more ingredients of detergents from the group of builders, bleaching agents and bleach activators, foam inhibitors and soil-release polymers.